

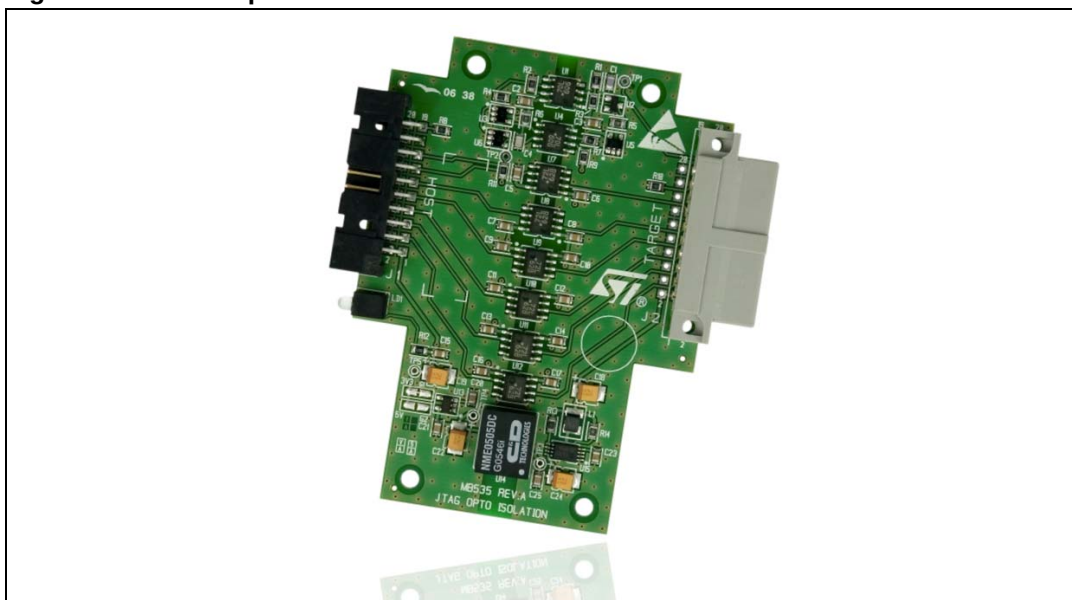
JTAG opto-isolation board

Introduction

The JTAG opto-isolation (AI-JTAG/OPTO-1) board can be connected between development tools and an application board to provide electrical isolation. This is essential when the development tools are not connected to the same ground as the application. It is also useful to protect the development tools from electrical spikes that often occur in some applications, such as motor control applications.

The JTAG opto-isolation board can be used with any tools that use the 20-pin JTAG standard connection for in-circuit debugging and programming of ST ARM core-based microcontrollers.

Figure 1. JTAG opto-isolation board



Features

- 1kV DC isolation
- Supports 3.3V or 5V operation, configurable by solder bridge
- Powered from target application using DC/DC converter powered by 3.3V or 5V
- JTAG standard 20-pin connection supporting TRST, TDI, TMS, TCK, RTCK, TDO, RESET signals
- 3.3V or 5V CMOS level compatibility
- 40nS maximum propagation delay for all unidirectional signals
- Power consumption on target application power supply less than 200mA

1 Hardware layout and configuration

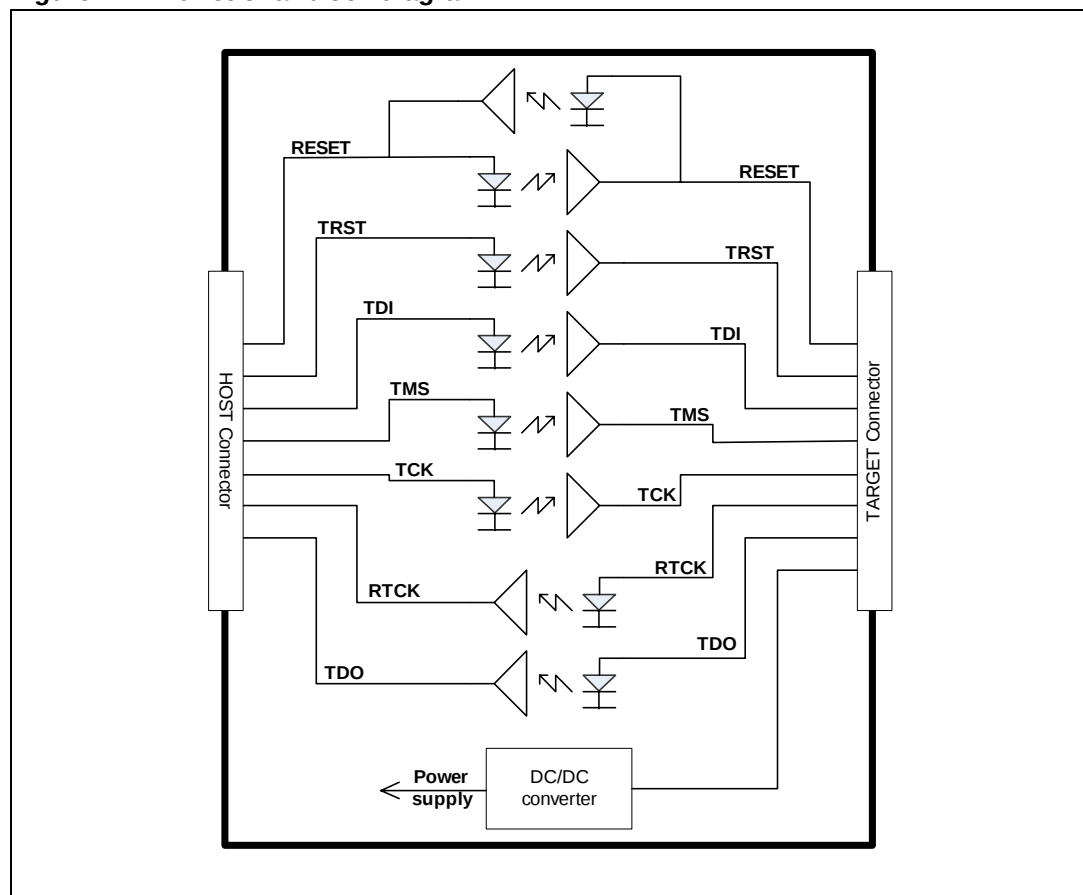
The JTAG opto-isolation board uses high speed optocouplers that allow a very low propagation time between input and output (typically 30nS). The board includes:

- a JTAG standard 20-pin female HOST connector (J1) that allows direct connection of the development tool,
- a JTAG standard 20-pin male TARGET connector (J2) for connection of the application board.

The opto-isolation board is delivered with a 7cm, 20-pin flat cable with JTAG standard connectors to facilitate the connection to the application board.

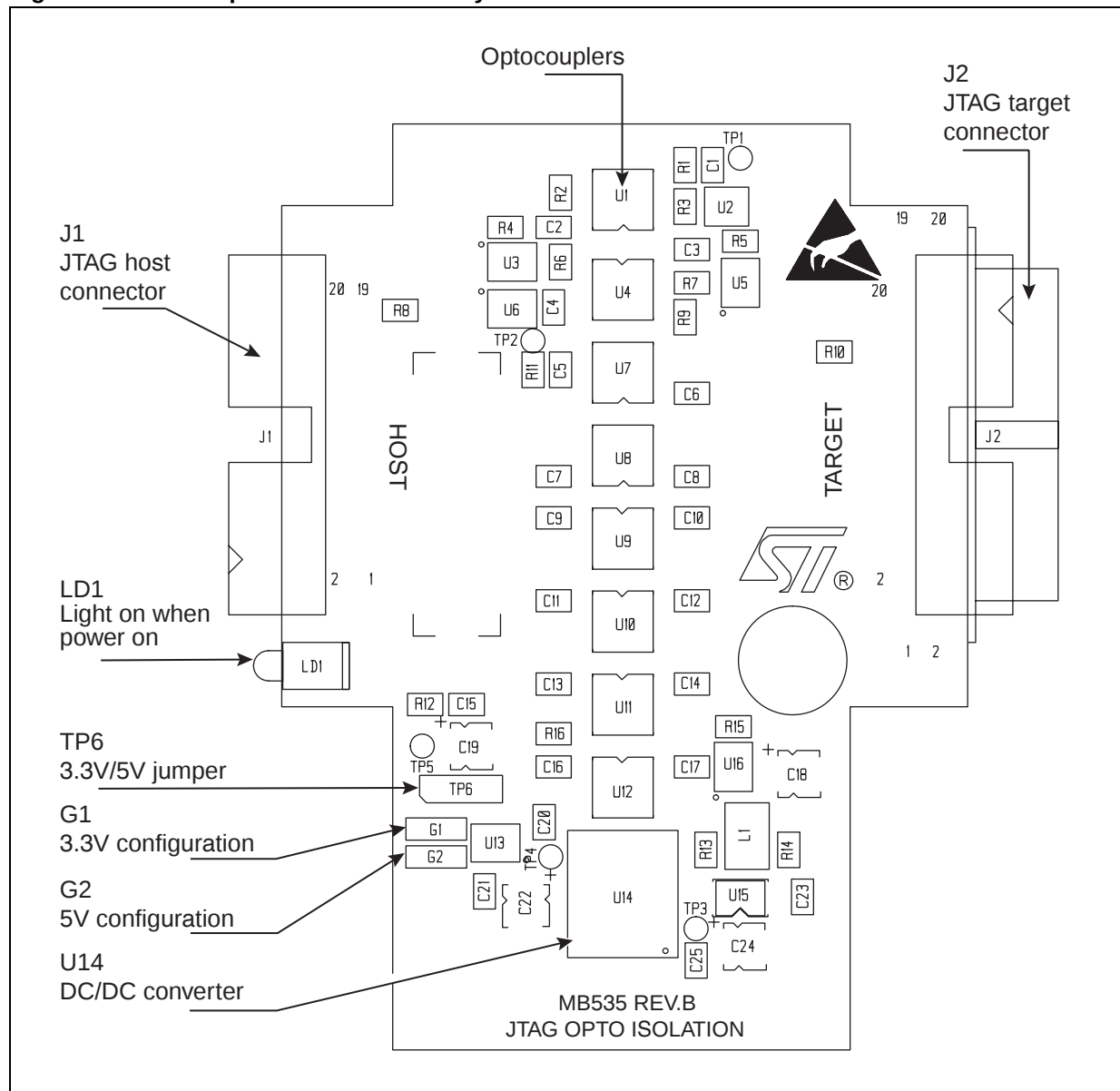
The hardware block diagram shown in [Figure 2](#) illustrates the functional connections between the development tool (HOST) and the application (TARGET). [Figure 3](#) will help you locate main features on the JTAG opto-isolation board.

Figure 2. Functional block diagram



For more detailed information on functional connections on the board, refer to [Figure 5 on page 6](#), and to [Figure 6 on page 7](#).

Figure 3. JTAG opto-isolation board layout



2 Power supply configuration

The JTAG opto-isolation board is powered by the target application power supply available on pin 1 and pin 2 of the J2 target connector. An isolated DC/DC converter on the board provides the power supply for components on the host side of the board. When host and target power supplies are present on board the LD1 LED is lit.

The board needs to be configured for 3.3V or 5V operation depending on the target application voltage.

The voltage is configured using a solder bridge on G1 or G2.

- G1 bridge ON/G2 bridge OFF: 3.3V configuration (default configuration)
- G2 bridge ON/G1 bridge OFF: 5V configuration

Caution: Components may be damaged if G1 and G2 are both configured ON.

If you need to change the power supply configuration frequently, it is possible to solder a 3-position jumper in place of TP6 on the silkscreen (see [Figure 3](#)). If a jumper is implemented, the G1 and G2 bridges must be OFF.

The voltage configuration with a jumper is shown in [Table 1](#).

Table 1. Voltage configuration with jumper

3.3V configuration (TP6 on pins 1 & 2)	5V configuration (TP6 on pins 2 & 3)
	

3 JTAG connectors

Figure 4. JTAG debugging connector (top view)

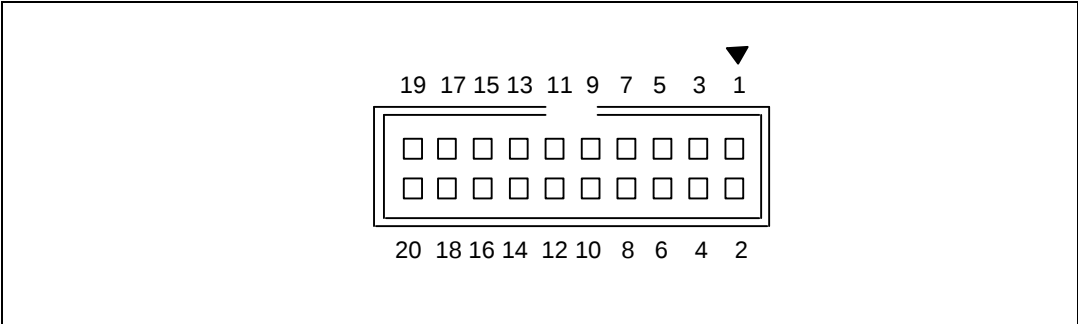


Table 2. JTAG debugging connector (CN7)

Pin number	Description	Pin number	Description
1	3.3V/5V power	2	3.3V/5V power
3	TRST	4	GND
5	TDI	6	GND
7	TMS	8	GND
9	TCK	10	GND
11	RTCK	12	GND
13	TDO	14	GND
15	RESET#	16	GND
17	DBGREQ	18	GND
19	DBGACK	20	GND

4 Schematic diagrams

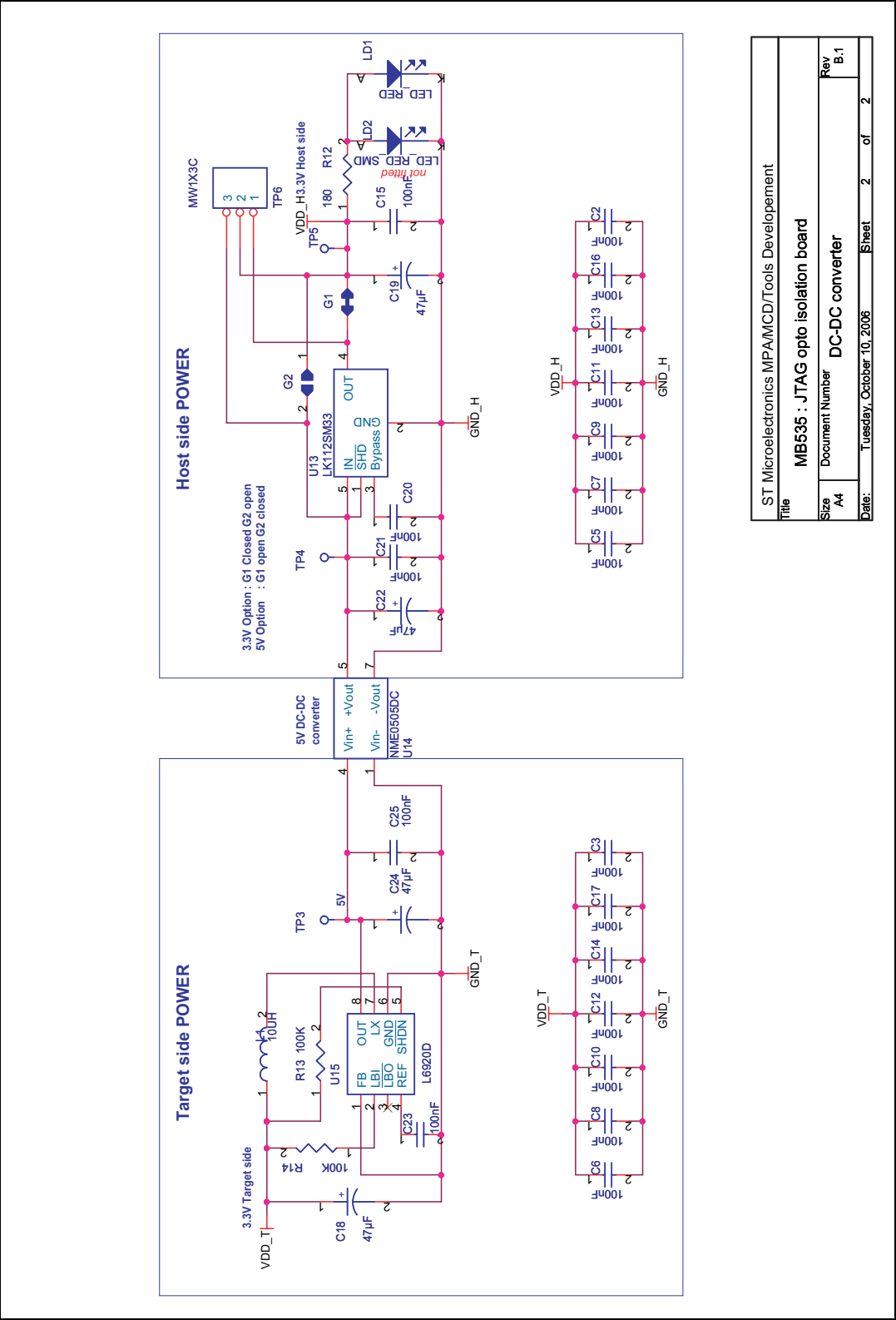
Host side

Target side

POWER

ST Microelectronics MPA/MCD/Tools Development		
Title MB535 : JTAG opto isolation board		
Size	Document Number	Rev B.1

Figure 6. DC-to-DC converter



5 Revision history

Date	Revision	Changes
7-Feb-2007	1	Initial release.

Please Read Carefully:

Information in this document is provided solely in connection with ST products. STMicroelectronics NV and its subsidiaries ("ST") reserve the right to make changes, corrections, modifications or improvements, to this document, and the products and services described herein at any time, without notice.

All ST products are sold pursuant to ST's terms and conditions of sale.

Purchasers are solely responsible for the choice, selection and use of the ST products and services described herein, and ST assumes no liability whatsoever relating to the choice, selection or use of the ST products and services described herein.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted under this document. If any part of this document refers to any third party products or services it shall not be deemed a license grant by ST for the use of such third party products or services, or any intellectual property contained therein or considered as a warranty covering the use in any manner whatsoever of such third party products or services or any intellectual property contained therein.

UNLESS OTHERWISE SET FORTH IN ST'S TERMS AND CONDITIONS OF SALE ST DISCLAIMS ANY EXPRESS OR IMPLIED WARRANTY WITH RESPECT TO THE USE AND/OR SALE OF ST PRODUCTS INCLUDING WITHOUT LIMITATION IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION), OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT.

UNLESS EXPRESSLY APPROVED IN WRITING BY AN AUTHORIZED ST REPRESENTATIVE, ST PRODUCTS ARE NOT RECOMMENDED, AUTHORIZED OR WARRANTED FOR USE IN MILITARY, AIR CRAFT, SPACE, LIFE SAVING, OR LIFE SUSTAINING APPLICATIONS, NOR IN PRODUCTS OR SYSTEMS WHERE FAILURE OR MALFUNCTION MAY RESULT IN PERSONAL INJURY, DEATH, OR SEVERE PROPERTY OR ENVIRONMENTAL DAMAGE. ST PRODUCTS WHICH ARE NOT SPECIFIED AS "AUTOMOTIVE GRADE" MAY ONLY BE USED IN AUTOMOTIVE APPLICATIONS AT USER'S OWN RISK.

Resale of ST products with provisions different from the statements and/or technical features set forth in this document shall immediately void any warranty granted by ST for the ST product or service described herein and shall not create or extend in any manner whatsoever, any liability of ST.

ST and the ST logo are trademarks or registered trademarks of ST in various countries.

Information in this document supersedes and replaces all information previously supplied.

The ST logo is a registered trademark of STMicroelectronics. All other names are the property of their respective owners.

© 2007 STMicroelectronics - All rights reserved

STMicroelectronics group of companies

Australia - Belgium - Brazil - Canada - China - Czech Republic - Finland - France - Germany - Hong Kong - India - Israel - Italy - Japan - Malaysia - Malta - Morocco - Singapore - Spain - Sweden - Switzerland - United Kingdom - United States of America

www.st.com

